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DECEMBER 3.

The President, SAMUEL G. DIXON, M.D., in the Chair.

Ten persons present.

A paper entitled "A New Species of *Ophibolus*," by Arthur Erwin Brown, was presented for publication.

The death of Herman Strecker, a member, was announced.

Lodel Creek and Skippack Creek.—MR. BENJAMIN SMITH LYMAN remarked that on October 26, 1901, the Mineralogical and Geological Section of the Academy of Natural Sciences made an excursion to Fisher's quarry, some twenty yards south of Lodel creek (on the U. S. Geological Survey's topographical sheet incorrectly called Landis brook, which is really the name of the next stream to the north). The quarry is near a small highway bridge, one mile northwest of Grater's ford, on the Perkiomen railroad. The rockbeds of the quarry belong to the American New Red, and, as observed in 1889, at the time of the State Geological Survey, show the following section from above downwards:

| | |
|---|---------|
| Dark red, rather soft shales, about | 5 feet. |
| Dark dull red, rather hard, thin-leaved shales, with fossil impressions and calcareous seams, about | 4 " |
| In all, about | 9 " |

The shales are close within the upper limit of the beds marked on the State Geological map of Bucks and Montgomery counties as the Lansdale shales. They dip here 13° N. $30\frac{1}{2}^{\circ}$ W. (true bearing).

The excursion party was so fortunate as to find a large slab of the stone of irregular shape, about five feet long by three feet wide and perhaps five inches thick, that proved to be particularly rich in interesting impressions. The whole of one side was covered with unusually perfect ripple marks, of about three-quarters of an inch in amplitude. In spite of the ripples, somewhat indistinct traces of two Dinosaur tracks, with three forward-pointing toes, could be discerned, each track about six inches in extreme length and about three inches in width. The two tracks are in line, and about twenty inches apart, centre to centre, evidently formed by

one animal moving forward. The hinder track seems to have, at a couple of inches in front of it and a little to the right, a small track, as if of the forefoot of the same animal. The forward track is too near the edge of the slab to have that accompaniment. At twenty inches back of the foremost toe-point of the hinder track there appears at the other edge of the slab to be the toe-point of another track, and a couple of inches in front of it perhaps very indistinct traces of the small forefoot. Other less distinct footmarks can be perceived to the left of this principal line of tracks.

On lifting up the slab, however, it was found that the other side had, in the absence of ripple marks, the cast of a number of other Dinosaur tracks of about the same size, and likewise two or three in succession at the same distance apart, and more distinctly accompanied by the impression of the small forefoot. In addition there are a number of smaller tracks, about half an inch across, that appear to be the footmarks of Labyrinthodonts. A few other less perfect impressions of ripple marks, raindrops and footmarks were found by the party in other parts of the quarry.

At the meeting of the Section on October 28, Messrs. Woolman and Lyman were appointed a Committee to revisit the quarry, and, if possible, send the slab to the Academy for preservation, which was accordingly done on the 2d of November, Mr. Uselma C. Smith kindly aiding in the work. It was found, however, on arriving at the quarry, that the ripple marks had in great part been broken off from the slab by the members of the previous excursion party, and the best of the tracks also removed from the other side. Nevertheless, a number of tracks as well as a considerable extent of the ripple marks were still left, and the slab was taken. Another slab of equal surface and like shape was found, and on turning over, proved to be the mate of the other, and to have a complete and perfect cast of the ripple marks, as well as some similar tracks on the other side. The uninjured slab was also taken and sent to the Academy. Mr. Josiah H. Fisher, the owner of the quarry, readily and freely made a gift of the specimens, with admirable public spirit.

A couple of smaller slabs showed very good ripple marking. One of them, of irregular shape, about eleven inches long by nine wide, and half an inch thick, has, on one side, shallow ripple marks of about two and a half inches in amplitude; and, on the other side, ripple marks of about the same dimensions, but surmounted by what seem to be smaller ripple marks of about half an inch in amplitude, or perhaps rillmarks: but may possibly be very confused impressions of *Dendrophycus*. It appears, however, to be an interesting example of more than usually complicated ripple marking. The slab has also very perfect worm tracks, and several sun cracks. At the original examination of the

quarry, in 1889, all the above-mentioned kinds of impressions were found, except the Dinosaur tracks; and, in addition, impressions of a plant were collected that may be a *Baiera*.

The excursion party of October 26 also, on the way home, visited a quarry on the roadside, on the southeast side of Skippack creek, about three-eighths of a mile southwest of the main road between Collegeville and Norristown, near a mill across the creek. The quarry is in dark red, hard, shaly sandrock of what is marked on the State Geological map of the two counties as Gwynedd shales, some 900 feet geologically below their top. The dip here is about 12° northwesterly. Here a large fossil Cycad leaf was found, about twenty-one inches long by eight inches wide. It is expected that this block will also be brought to the Academy. It may be, as Miss Walter suggests, *Pterophyllum spatulatum*.

The party thence proceeded southward to Eagleville, on the top of a hill of the Gwynedd shales. These comparatively hard dark shales all along their outcrop make prominent hills, with the lower lands formed on the southeast of them by the softer and in greater part red, but further south gray, Norristown shales, and on the northwest by the likewise softer and almost universally bright red Lansdale shales, succeeded northward by the harder and in great part greenish or blackish Perkasio shales, again with higher hills, and yet further north by the softer red Pottstown shales. This succession of beds of distinct character, with their outcrop of special topographical character extending throughout the two counties, all conforming uniformly to several variations of structure, with corresponding curves in the strike of the beds and everywhere with correspondence in the dips, and with no evidence whatever of any repetitions of the same sets of beds (except near the great Buckingham Mountain fault), is convincing proof that there is no overthrust fault parallel to the strike that could diminish the apparent total thickness of the beds. Such a fault, indeed, would have to be of wonderful shape, in conformity to a somewhat complicated folding of the beds. It is, moreover, in the highest degree improbable that such faults, the result of excessive horizontal pressure, with beds of great stiffness and cohesion, necessarily causing extremely steep and overturned dips, could occur in a region of gentle dips and mainly soft beds.

The foot tracks, ripple marks, raindrop impressions and sun cracks found at Fisher's quarry, the Cycad leaves and the raindrop impressions at the Skippack quarry, and other impressions and sun cracks at many other points in the New Red of this region, show clearly that the rocks were laid down in an estuary that was shallow through a great part of the process, if not throughout. There must have been submergence to correspond with the accumulating beds, and doubtless caused by their weight upon this portion of the earth's crust. As the sedimentary material has plainly

come from both sides of the narrow estuary, the accumulated thickness of the beds must have been far greater, perhaps six times greater, than it would have been with equally far-reaching and rapid drainage on the single shore of an ocean where the sediments would be carried three times as far from land. This consideration may make belief in the thoroughly demonstrated great thickness of the New Red in Montgomery county a little easier to those, if any there be, who still fondly cling to the old purely conjectural estimates.

DECEMBER 10.

The President, SAMUEL G. DIXON, M.D., in the Chair.

Twelve persons present.

Papers under the following titles were presented for publication:

“Additions to the Japanese Land Snail Fauna, V,” by Henry A. Pilsbry.

“Catalogue of the Clausiliidæ of the Japanese Empire,” by Henry A. Pilsbry.

DECEMBER 17.

Mr. CHARLES MORRIS in the Chair.

Twelve persons present.

The deaths of William F. Norris, M.D., and Rush S. Huidekoper, M.D., members, were announced.

DECEMBER 24.

Mr. CHARLES MORRIS in the Chair.

Seven persons present.

Papers under the following titles were presented for publication:

“On the Common Brown Bats of Peninsular Florida and Southern California,” by S. N. Rhoads.